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ABSTRACT

The National Education Goals Panel (NEGP) tracks and reports annually on 33 indicators linked to the 8 National Education Goals. The NEGP's 1997 report showed positive gains on the greatest number of indicators for North Carolina and Texas. These gains included significant gains on the 1996 National Assessment of Educational Progress (NAEP) in mathematics. The NEGP commissioned this study to see if the improvements were really significant and to try to identify the factors that could or could not account for the educational improvement in these two states. The analysis confirms that the gains in academic achievement in both states are both significant and sustained. North Carolina and Texas posted the largest gains on the NAEP administered between 1990 and 1997, and these results were mirrored in state assessments administered in the same period. There is also evidence that the scores of disadvantaged students improved more rapidly than those of advantaged students. Several factors commonly associated with student achievement, including real per-pupil spending, teacher/pupil ratios, teachers with advanced degrees, and experience levels of teachers, do not appear to explain the test score gains. Texas and North Carolina rank at or below the national averages on these characteristics, and none of them changed during the study period in ways that would explain the gains. The study concludes that the most plausible explanation for the score gains is found in the policy environment established in each state. Both states pursued similar paths to improvement, and each succeeded in changing the organizational environment and incentive structure for educators in ways that led to improvement. The keys to this change include: (1) creating an aligned system of standards, curriculum, and assessments; (2) holding schools accountable for improvement by all students; and (3) support from businesses in developing, implementing, and sustaining these changes over time. (Contains 16 figures, 4 tables, and 18 references.) (Author/SLD)

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EXPLORING RAPID ACHIEVEMENT GAINS IN NORTH CAROLINA AND TEXAS

ED 425 204

NATIONAL EDUCATION **GOALS** PANEL

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David Grissmer and Ann Flanagan

November, 1998

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Lessons from the States

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EXPLORING RAPID ACHIEVEMENT GAINS IN NORTH CAROLINA AND TEXAS

NATIONAL
EDUCATION
GOALS
PANEL

David Grissmer and Ann Flanagan

November, 1998

This paper is commissioned by the National Education Goals Panel. The opinions expressed in this paper are those of the authors and do not necessarily reflect those of the Goals Panel or its members. A summary of this paper appears in *Promising Practices: Progress Toward the Goals 1998*.

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Exploring Rapid Achievement Gains in North Carolina and Texas

David Grissmer and Ann Flanagan

Outstanding State Success: North Carolina and Texas are 2 states which:

- Made greater combined student achievement gains in math and reading (on NAEP, 1992-1996) than any other states. The gains were significant and sustained.
- Student achievement gains were mirrored in state assessments administered during the same period.
- Made significant improvement on more measures of progress toward National Education Goals than any other states (NEGP 1997).

These rapid achievement gains were found NOT to be due to:

- Increased real per pupil spending
- Reduced teacher/pupil ratios (class size)
- Having more teachers with advanced degrees or more years of experience

How did they do it? Three overarching reasons for success were:

- Leadership from the Business Community
- Political Leadership
- Continuity and Stability of Reform Policies Over Time

What were their Key Reform Policies?

- State-wide Academic Standards by Grade for Clear Teaching Objectives
- Holding All Students to the Same Standards
- State-wide Assessments Closely Linked to Academic Standards
- Accountability Systems with Consequences for Results
- Increasing Local Flexibility for Administrators and Teachers
- Computerized Feedback Systems, Data for Continuous Improvement
- Shifting Resources to Schools with More Disadvantaged Students
- Infrastructure to Sustain Reform

Executive Summary

The National Education Goals Panel tracks and annually reports on 33 indicators linked to the eight National Education Goals. These data points provide a picture of individual state's success in improving education for their children. After an analysis on the Goals Panel's 1997 report, two states—North Carolina and Texas—stood out for realizing positive gains on the greatest number of indicators. This included significant gains on the 1996 National Assessment of Educational Progress (NAEP) in mathematics. The Goals Panel commissioned Dr. David Grissmer to conduct an analysis of education reforms in both states to determine that the improvements were indeed significant and to seek to identify the factors that could and could not account for their progress.

The analysis confirms that gains in academic achievement in both states are significant and sustained. North Carolina and Texas posted the largest average gains in student scores on the tests of the National Assessment of Educational Progress (NAEP) administered from 1990 to 1997. These results are mirrored in state assessments administered during the same period, and there is evidence of the scores of disadvantaged students improving more rapidly than those of advantaged students.

Nor does it seem that several factors commonly associated with student achievement—real per pupil spending, teacher/pupil ratios, teachers with advanced degrees, and experience levels of teachers—explain the test score gains. Texas and North Carolina rank at or below national averages on these characteristics and none of them changed during the period under study in ways that would explain the gains.

The study concludes that the most plausible explanation for the test score gains are found in the policy environment established in each state. Both states each pursued remarkably similar paths, and each succeeded in changing the organizational environment and incentive structure for educators in ways that led to improvement. The keys to this change include: creating an aligned system of standards, curriculum, and assessments; holding schools accountable for improvement by all students; and critical support from business in developing, implementing, and sustaining these changes over time.

Explaining the Gains

The report relied on case studies of the two states to identify the policies and actions that most plausibly explain the large gains in elementary and junior high school test scores in North Carolina and Texas. The case studies revealed a similar set of policies in both states that were implemented at times that coincided with the state test score gains. Changes in the organizational environment and incentive structure for educators emerge as the most decisive aspects of the policies.

However, similar sets of policies exist in other states. While North Carolina and Texas were certainly among the first states to pursue this policy course, their success in raising academic achievement is related as much to the way in which the policies were developed, implemented and sustained as to the policies themselves. Three elements stand out among the latter factors—leadership from the business community, political leadership, and continuity of the reform agenda.

Leadership from the Business Community

In both North Carolina and Texas the business community played a critical leadership role in developing and sustaining reform. Business leaders helped form the strategic plan for improvement, forging compromises with the education interests, and enabling passage of the necessary legislation. The strategic plans in both states were initially opposed by coalitions of education interests, including representatives of school boards, principals and teachers.

In both states, business funded organizations that brought together the business, education and policymaking communities. In North Carolina, this began in 1984 with the Commission on Education for Economic Growth and later the North Carolina Public School Forum. In Texas in the early 1980s it began with the Perot Commission, and later the Texas Business-Education Coalition. Texas business leaders also formed and funded Texans for Education, an independent lobbying organization that represented the business perspective in education reform. These organizations provided a forum to discuss education reform issues and forge compromises among concerned groups that underlay subsequent legislation. Developing these systems in both states was a long and arduous process, and the business community in both states was the single most stable, persistent, and long-term influence for the reform agenda implemented.

Business involvement was also characterized by the presence of a few business leaders who became deeply involved. They took the time to learn the issues in education and sustained their involvement for over a decade. They developed knowledge of all sides of education issues, became acquainted with decision makers at all levels, and could articulate the issues to other, less involved business leaders.

Political Leadership

Political leadership in both states was essential at critical points in the reform process. During the period from 1984 to 1992, that leadership came from different offices—the Governor, Lieutenant Governor, or key legislators. Neither state had continuity in party affiliations of key office holders, and both states experienced significant turmoil around education issues during this period. Passage of legislation in neither state was accomplished on straight party-line votes but rather involved coalitions from both parties. The business community remained a consistent external force advocating for the reform agenda.

Since the early 1990s, both states have benefited from the election of Governors with education leading their list of policy priorities. Governor Hunt has sponsored many

new initiatives to further the reform agenda, including an emphasis on early childhood education through the Smart Start program and major legislation to improve the quality of instruction and to align teacher education in North Carolina with the state standards. Governor Bush has emphasized programs for mastery of reading skills in the early grades and a renewed focus on decentralization.

Such leadership seems essential to build on and maintain the momentum of earlier reforms and to help maintain the still somewhat fragile coalitions supporting educational reform. Without political leaders willing to build on the foundation of earlier reform initiatives, it is difficult if not impossible to create the continuity in the reform agenda that is critical to long-term success.

Consistency of the Reform Agenda

Efforts to improve education have all too often been examples of reform *du jour*. Over time and changes in leadership the old reform agenda is abandoned and a new agenda put forward. In North Carolina and Texas this has not been the case. Despite changes of Governors and among legislators, the current incumbents have chosen to continue the reform agenda and to find ways to build on and improve it. The on-going business support in both states has been an important factor in promoting this continuity.

The current wave of education reform in North Carolina and Texas is a decade old and generating strong evidence that it is working. Acceptance of the new system is growing among educators as they realize they can successfully meet its challenges. Most importantly, data from state assessments and NAEP show that academic achievement is rising for all students.

The Policies

The initiatives that led to the new policies began in both states in the late 1980s and the policies were put in place in the early 1990s. The main elements include:

State-wide Standards by Grade for Clear Teaching Objectives

State-wide academic standards were developed and adopted in both states in the late 1980s and early 1990s and supported consistently thereafter. These standards were set for each grade and in several subjects. Teachers in all grades were given clear objectives for what students should know. In both states efforts were made to align the textbooks and curriculum with the state-wide standards.

Holding *All* Students to the Same Standards

Disadvantaged students are held to the same standards as advantaged students. Only students with significant learning disabilities are held to their Individual Education Plan rather than the state academic standards. Texas statute requires student assessment results to be disaggregated by race, ethnicity, and the socio-economic status (SES) of the

student. To meet the requirements of the accountability system, each population subgroup in a school or district must meet the performance targets.

State-wide Assessments Closely Linked to Academic Standards

New state-wide assessment tests were also developed in both states which reflected the standards at each grade. Assessment in both states is done in every grade from 3 to 8 in reading and math. State-wide testing to these standards began in Texas in 1993-94 and in North Carolina in 1992-93. The standards and assessments have remained substantially unchanged in each year since that time.

Accountability Systems with Consequences for Results

Both states rate schools based on their performance on the state tests. Each provides monetary rewards for schools based on their test performance. Both states reward schools financially for improved performance, and have the power to disenfranchise school districts and remove principals based on sustained levels of poor performance. The two state systems take into account both absolute levels of test scores as well as gain scores. Schools are rated into categories ranging from exemplary to poor performing. The gain score is used as the primary ranking mechanism, but schools can be penalized if they do not have a specified proportion of students reaching a minimum proficiency level.

Both state systems show awareness of factors that could provide unfair advantage to certain schools, including the social and economic advantages of the school community. Care is taken in both states to take account of incoming students during the year and to adjust beginning gain scores to the actual students in the schools at the beginning of the year. Both keep close scrutiny of the students not taking tests. Thus the procedures- although not perfect- are designed to try and take account of schools with higher student turnover or large numbers of new students with low or high test scores, and to protect against manipulation by teachers or principals.

Increasing Local Control and Flexibility for Administrators and Teachers

The strategic plans developed in each state in the late 1980s and early 1990s acknowledged that teachers and administrators could not be held accountable unless they were given authority and flexibility locally to determine how to meet the standards. In both states, unnecessarily restrictive statutes governing schools and teaching were repealed. The constraints placed on district superintendents and principals for how money is spent were reduced. The policy objective was to allow schools locally to vary the approaches they could take to achieve the standards.

Computerized Feedback Systems, Data for Continuous Improvement

Scores on the test are provided to students, parents, teachers, schools and school districts. Both states have a well-designed computerized system of storing the testing

information and providing access to it in various ways for teachers, principals and school districts. Tests are graded centrally in Texas and in regional locations in North Carolina. Access to school level results is provided on the Internet in both states. Both states have developed varied formats for reporting test results by sets of questions related to key learning objectives. Teachers in both states have access to summaries and individual tests of students entering their classes each year. In both states test items are made available after each test to the public to counter criticism of bias in test items.

Shifting Resources to Schools with More Disadvantaged Students

Both states gradually shifted resources to schools with more disadvantaged students. This shift was partially the result of judicial decisions requiring the state to fund school districts more equitably. However, the shift may be an essential element of achieving a system perceived to be fair and equitable to teachers and administrators. The acceptance, endurance and effectiveness of these policies may rest upon the perception that the distribution of resources among schools and school districts is fair and equitable.

Conclusion

Both states have built a substantial infrastructure for supporting a process of continual improvement in education. This infrastructure has been jointly funded through the public and private sectors and includes a mix of public, non-profit and private sector participation and organizations. This infrastructure includes state focused research institutes and centers, organizations primarily devoted to research based policy formulation, a network of business-school system partnerships, a developing variety of private sector "cottage industries" aiding school improvement with new systems and training methods. This infrastructure is supporting a continual process of innovation and improvement in the school systems and other support systems for children.

It includes a continuing series of educational improvement plans- each building on previous agendas. It includes continuing analysis and evaluation of the results of previous reform. Perhaps the most important part of this infrastructure is the trust, shared knowledge and shared objectives that has developed among educators, policymakers and business leaders. This trust has developed partly based on the success in lifting achievement. But it is also based on a shared experience of working together over many years to improve education.

Exploring Rapid Achievement Gains in North Carolina and Texas

Introduction

The National Education Goals Panel is tracking the progress of states in improving the education of their children. States are taking different paths in trying to achieve these goals. In the last 10 years, a diverse and unprecedented number of policies and programs have been initiated by the states to improve the outcomes of their K-12 education systems. This diversity can provide a powerful advantage in the long run if analyses can identify which of the many different programs and policies are effective. Identifying successful programs and policies would enable their diffusion across states resulting in more rapid nation-wide progress toward the National Education Goals.

The National Education Goals Panel has tracked for each state a diverse set of indicators related to children's academic performance, their readiness for school, and educational environment since 1991. The challenge to research is to link the movement of each indicator to specific policies and programs. A combination of research techniques can eventually be brought to this task. A rich research literature can be tapped into that has linked programs and policies to many indicators in different contexts. Case studies of states that show different rates of improvement can be useful to developing plausible hypotheses. Statistical analysis of the data across all states over time for each indicator can also help isolate those policies and programs that may be working across several states. This analysis can be a complex and uncertain process, but one that should be carried out if we are to take advantage of the diversity inherent in our system of federal and state governments.

This report takes an initial step in the direction of trying to systematically link movement of indicators with policies and programs. It focuses on one set of panel indicators—elementary school achievement scores in math and reading. It chooses two states showing large gains in achievement scores from 1990-1997. The states of Texas and North Carolina show the largest average gains among states on the National

Assessment of Student Progress (NAEP), and corresponding gains on their state assessment tests.

This report seeks to place the gains in these two states in a national context and seeks to identify through case studies in each state some plausible factors that might be associated with these gains. We first review elementary score gains nationally and in states to place the gains in Texas and North Carolina in context. We then review a set of factors that are commonly linked to achievement score gains, but are very unlikely to have played much of a role in explaining the Texas and North Carolina gains. We then present a brief case study done in each state to try and identify plausible hypotheses which might explain the gains. In each state the timing of the gains approximately coincided with the implementation of similar educational reform initiatives. We describe these initiatives and their evolution in each state. These initiatives represent the leading hypothesis for explaining the gains in these two states, but much more research across all states is needed which examines these and other factors before any evidence becomes compelling.

Trends in Long Term National NAEP Scores[1]

Figures 1 and 2 show the national NAEP scores for 9 and 13 year old black and white students from 1971 to 1996.[2] The scores show that black and white students of both ages are scoring higher in math and reading in 1996 than in the early 1970s. Black students made larger gains than white students did over this period in both math and reading. Math gains have also been larger than reading gains for both ages and both racial groups. A gain of .5 standard deviation translates to a gain of about 17 percentile points. So black students at ages 9 and 13 scored about 17 percentile points higher on a national scale in 1996 than their counterparts in 1971.

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[1] Most of this description of NAEP trends has been previously published in Grissmer, et al, 1998a.

[2] The NAEP scores have been converted to relative scores by assuming the earliest test score for each race is zero. Thus the scores reflects changes in black and white scores from the earliest test. The scores are converted to standard deviation units by taking the mean score difference from the earliest test and dividing by a metric that remains constant over the period- the standard deviations of all students for the earliest year. A one standard deviation change in scores corresponds to a change of approximately 34 percentile points.

Such large gains for very large national populations over such short time periods are rare, if not unprecedented. Scores on IQ tests given to national populations seem to have increased gradually and persistently throughout the twentieth century, both in the United States and elsewhere (Flynn, 1987; Neisser, 1998). But no evidence exists in these data involving large populations showing gains of the magnitude made by black student cohorts over the period 1971-1986. It is even unusual to obtain gains of this magnitude in intensive programs explicitly aimed at raising test scores. Early childhood interventions are widely thought to have the largest potential effect on academic achievement, partly because of their influence on brain development. Yet only a handful of "model" programs have reported gains as large as half a standard deviation (Barnett, 1995). These programs were very small scale programs with intensive levels of intervention.

From 1971 to 1984 black students at age 9 and 13 show significant gains in scores, but the corresponding white scores showed little movement. One analysis of the large black score gains hypothesizes two plausible causes for those gains (Grissmer, et al, 1998a). One hypothesis suggests that the dramatic social, economic and legal changes associated with the Civil Rights movement and the War on Poverty changed the behavior and motivation of black students, parents and their teachers in ways that significantly changed the black schooling experience. A variety of factors associated with these movements such as desegregation, improved future economic opportunity, more equal treatment in classrooms and increased compensatory spending in education may be some of the reasons for higher black scores. A second set of contributing factors may have been changes in teachers and schools occurring at this time: declining pupil/teacher ratios nationwide, more experienced and educated teachers and tougher curriculum.

Until 1984, math and reading scores seemed to move together. The size of gains in white math and reading scores through 1984 are similar, as are the math and reading gains among blacks. Since 1984 black reading scores have not increased further and even show some decline, while black math scores have shown continuing gains. White students at age 9 show stable reading scores, but significant gains in math. Only white students at age 13 show both increasing math and reading scores, although the math gains are larger than reading gains. Unlike the period from 1971 to 1984 where black gains

were much larger than white gains in both subjects and age groups, black and white math score gains since 1984 are similar, and white reading scores show more gains than black reading scores since 1984.

Figure 1- National NAEP Math and Reading Scores for Age 9 Students by Race

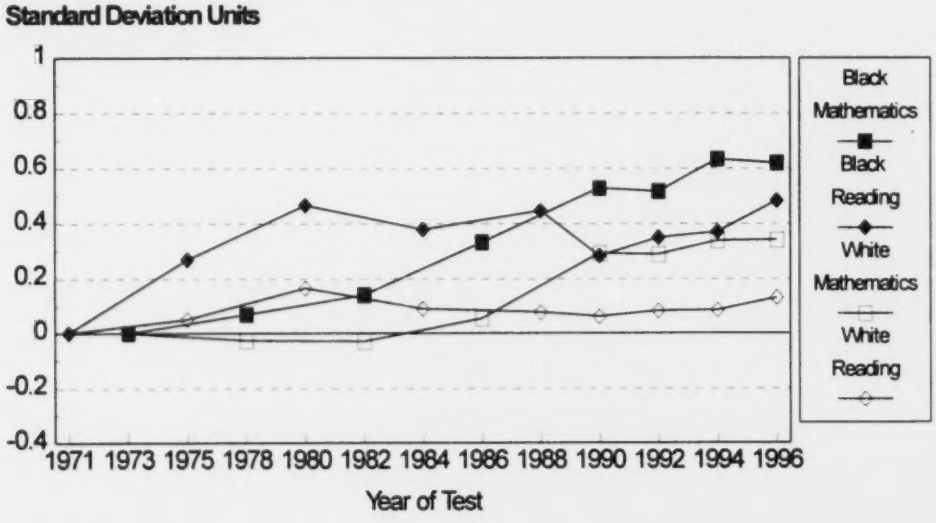
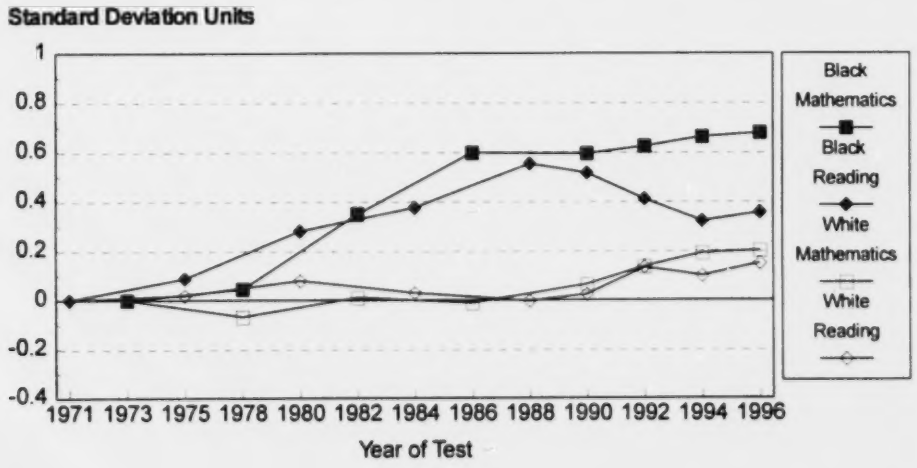


Figure 2- National NAEP Math and Reading Scores for Age 13 Students by Race



The National Education Goals Panel state indicators on achievement cover the period from 1990 to 1996. During this period the national NAEP data generally show rising scores. Scores in reading and math for age 9 and 13 white students all increased. Black scores in reading and math rose for age 9 black students, as did math scores for age 13 black students. Only age 13 black student's reading scores show declines. The national gains combined for students from all racial/ethnic groups in reading or math by age group were .2 standard deviation or less in this period, and were about .10 standard deviation when averaged across subject and age group. So the national trends show generally increasing scores for the period when state specific NAEP scores were collected.

Trends in State Assessment Scores

It is not possible with the long-term national NAEP scores to compare states due to insufficient sample size. However, since 1990 the NAEP tests have been administered to representative samples of students in about 44 participating states. Table 1 describes the seven tests that have been given in reading and math at the state level. Gains in scores can be estimated between 1990 and 1996 for eighth grade math tests, between 1992 and 1994 for fourth grade math tests and between 1992 and 1994 for fourth grade reading tests.

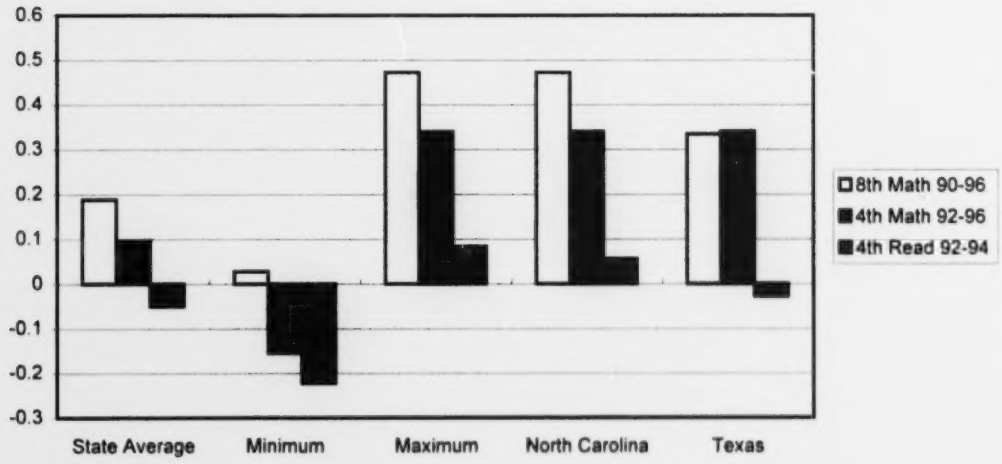
The state and long term national assessments are not strictly comparable since not all states are included in the state assessments, and the state tests are based on more recently designed assessments which emphasize more "critical thinking" skills. However, Figure 3 shows that states register positive gains on average for the fourth and eighth grade math tests. Fourth grade reading scores show small losses. These results are approximately similar in magnitude to the trends in the national scores for similar time periods.

Table 1- Description of Seven State NAEP Reading and Math Tests

Year	Subject	Grade Level	States Tested	Range - Student Samples	Range – School Samples
1990	Math	8	38	1,900-2,900	30 - 108
1992	Math	4	42	1,900-2,900	44 - 143
1992	Reading	4	42	1,800-2,800	44 - 148
1992	Math	8	42	2,000-2,800	28 - 112
1994	Reading	4	39	2,000-2,800	51 - 117
1996	Math	4	44	1,800-2,700	51 - 132
1996	Math	8	41	1,800-2,700	30 – 116

Figure 3 also shows the largest and smallest gains among states on each test as well as the gains for North Carolina and Texas. The results show that gains in Texas and North Carolina in both reading and math were much higher than the average state gains, and close to that of the state with the highest gains. If we average the gains across all grades and subjects, North Carolina and Texas show the highest average gain among all states.[3]

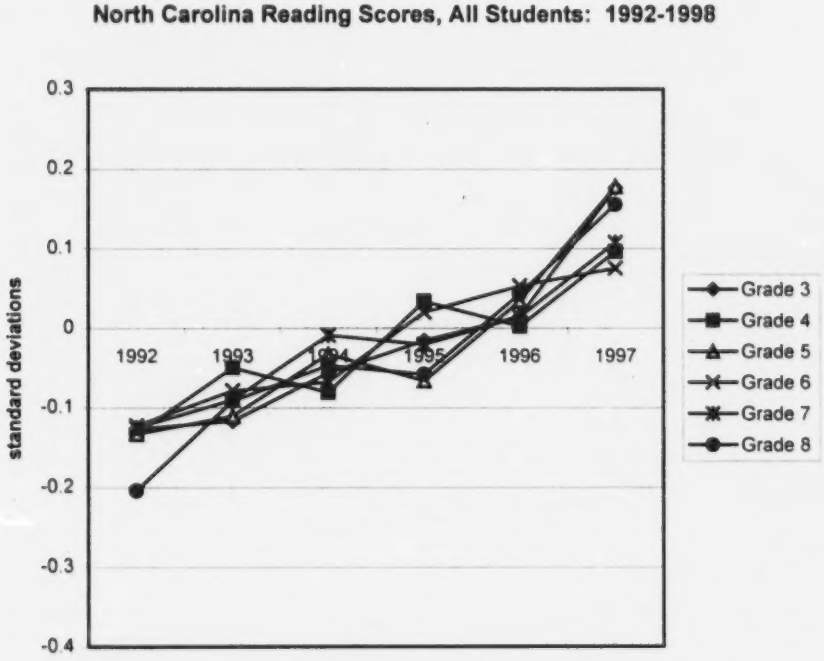
Figure 3- Average Gains in Scores on the State NAEP Achievement Tests



[3] A statistical analysis of the NAEP score trends controlling for changing demographics and participation rates shows Texas and North Carolina to have the highest average gain across tests among states who took at least six NAEP tests.

Both Texas and North Carolina have their own state assessment tests. The gains registered by the state NAEP tests are also mirrored in the North Carolina and Texas state assessment tests. Figures 4 and 5 show the results of the North Carolina state assessments during the period when their state scores are comparable.[4] The scores show significant gains in both reading and math at each grade, but math gains are larger than reading gains. The scores show gains of .1 to .35 standard deviation in reading scores across grades and .2 to .5 in math tests. A gain of .25 standard deviation would mean that students in 1997/98 would score, on average, about 8-9 percentile points higher than their counterparts in 1992/93. The average student in 1997/98 scoring at the 50th percentile would score at the 58th percentile of the 1992/93 group.

Figure 4- Scores on the North Carolina Reading Assessment



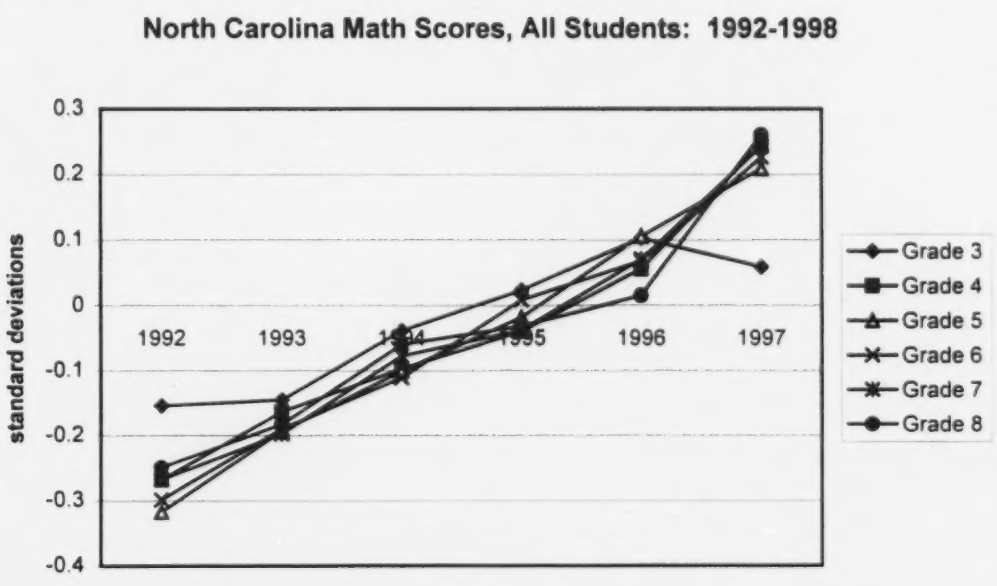
Figures 6 and 7 show the results from the Texas state assessments during the period when they are comparable. The results also show large gains in both math and

[4] The scores for each grade are normalized to a mean of zero and divided by the standard deviation for each grade.

reading scores across most, but not all, grades. Gains in grade 8 lagged significantly behind other grades. Math gains are larger than reading gains. The gains in reading across grades 3-7 range from approximately .15 to .50 standard deviation, while the gains in math across grades 3-7 are approximately .25 to .60 standard deviation.

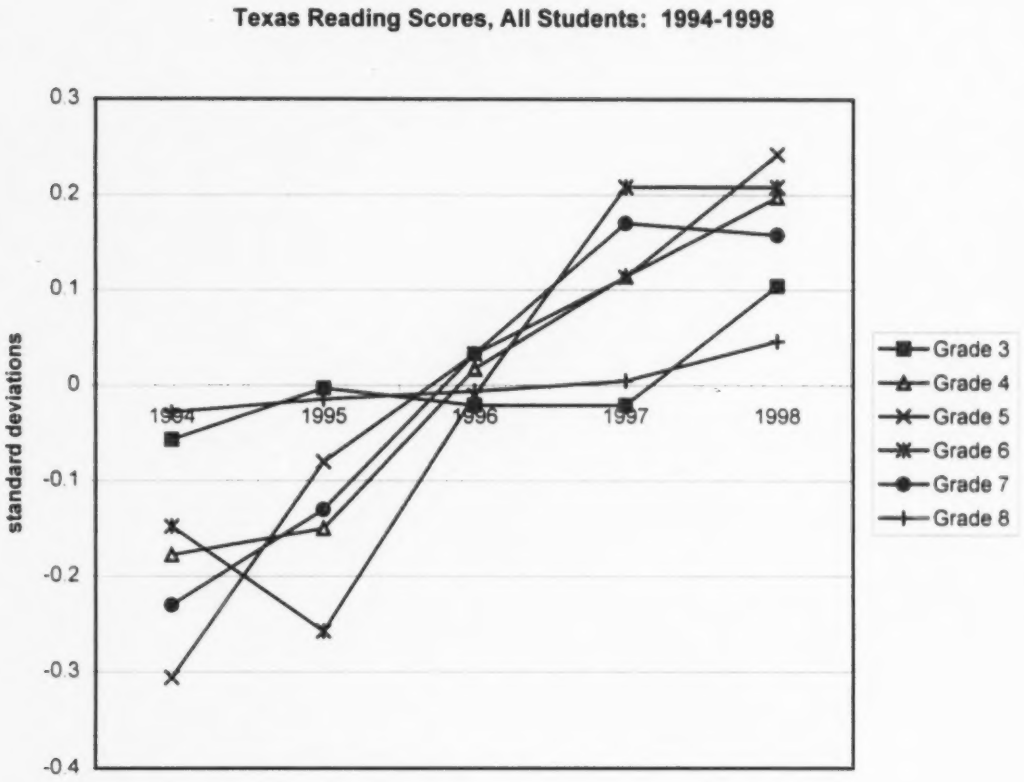
The assessment results in Texas when averaged across grades show larger gains for Hispanic and black students than for non-Hispanic white students—although white students are also making significant gains (See Figures 8-9).[5] In North Carolina, the gains made by black and non-Hispanic white students are approximately the same, but the much smaller group of Hispanic students made smaller gains (See Figures 10-11).

Figure 5- Scores on the North Carolina Math Assessment



[5] The score for each racial/ethnic groups is normalized to a mean of zero and divided by the standard deviation of the scores for all racial/ethnic groups.

Figure 6- Scores on the Texas Reading Assessment



To summarize, Texas and North Carolina made the largest average gains in the nation on the seven state NAEP scores given from 1990 to 1996. Large gains were also registered on both reading and math scores on their individual state assessment tests that reflect the period from 1992 to 1997. Gains in math are larger than for reading on both the state NAEP tests and the individual state assessments. The individual state assessments show larger gains for minority students in Texas, similar gains for black and non-Hispanic white students in North Carolina, but smaller gains for Hispanic students.

Figure 7- Scores on the Texas Math Assessment

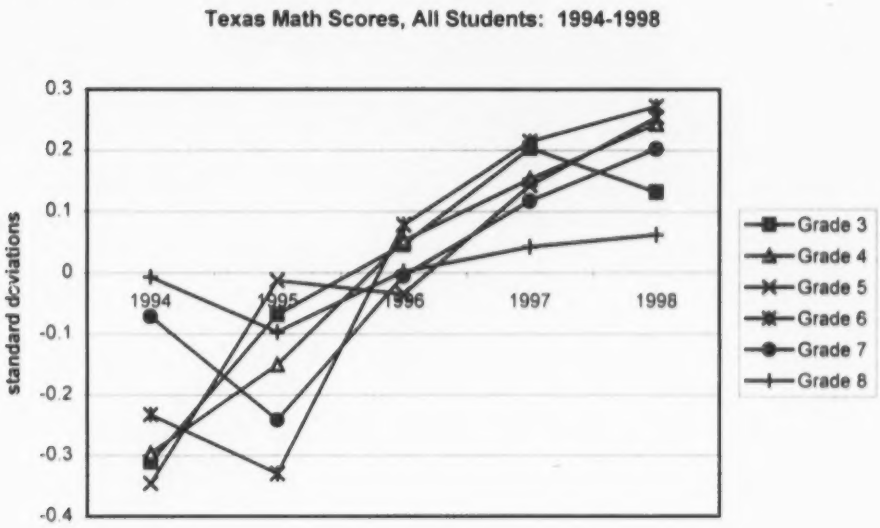


Figure 8 - Average Scores Across Grades on the Texas Reading Assessment by Race

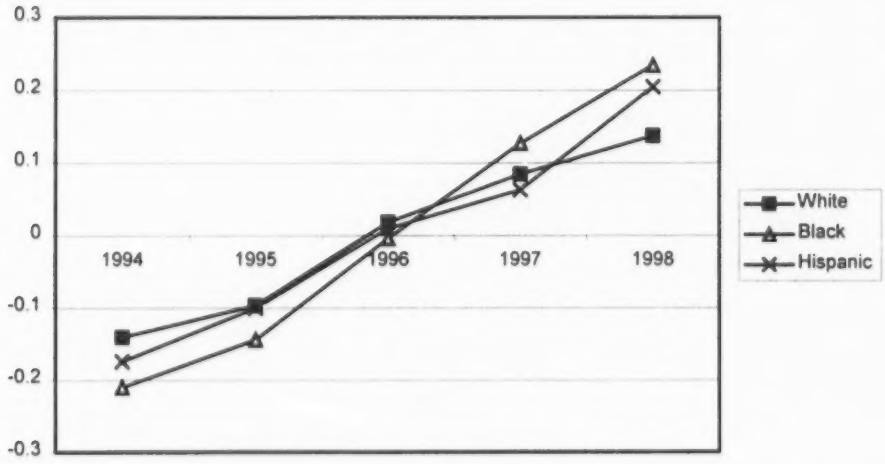


Figure 9 - Average Scores Across Grades on the Texas Math Assessment by Race

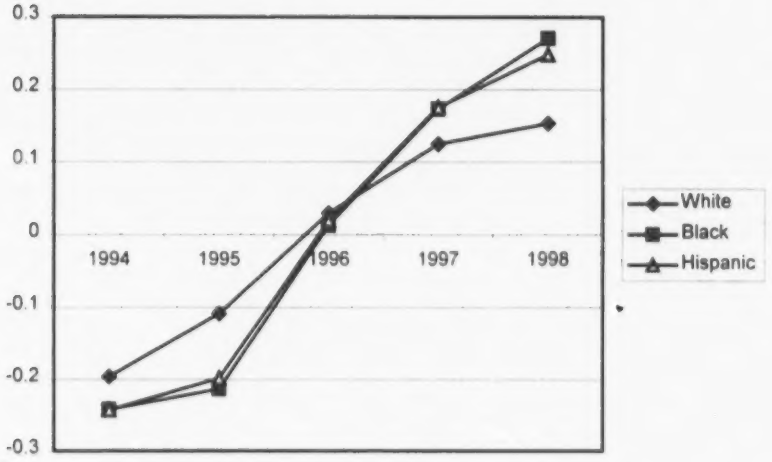


Figure 10- Average Scores Across Grades Scores on the North Carolina Reading Assessment by Race

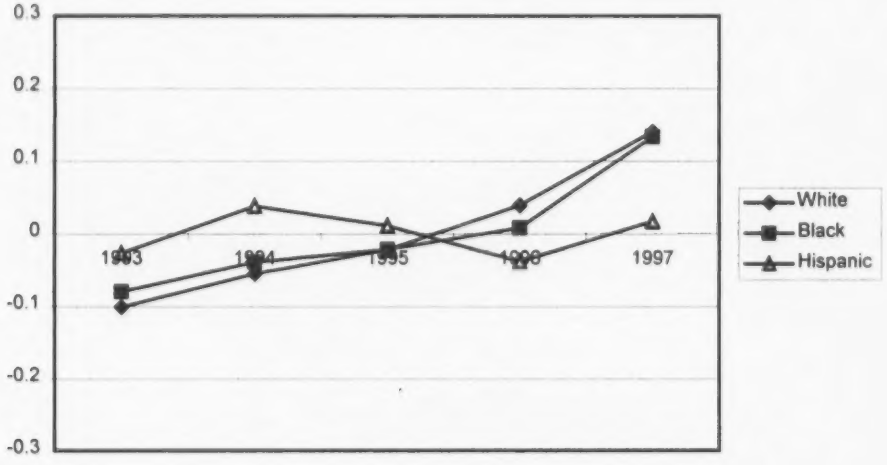
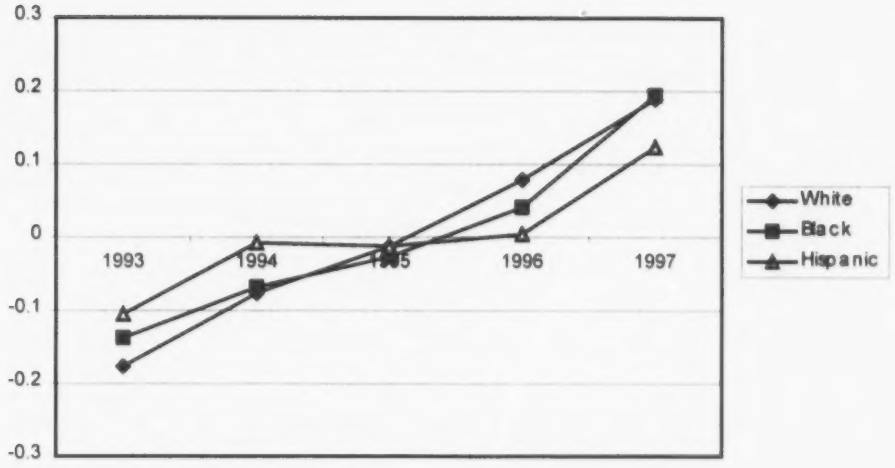


Figure 11 - Average Scores Across Grades on the North Carolina Math Assessment by Race



What Cannot Explain the Score Gains

Characteristics of Texas and North Carolina Students and Schools

Although Texas and North Carolina have the largest gains in the nation, their average NAEP state scores across all seven tests still place them below the score of the average state. Texas scores averaged across the seven NAEP tests from 1990-1996 ranked 28 out of 45 states, and North Carolina students were ranked 35 out of 45. Their low ranking among states is primarily due to the above average proportion of minority students and below average levels of family income and parental education (see Table 2). A more valid comparison of their achievement is to compare the results by racial/ethnic groups across states. Figure 12 shows that when the seven NAEP scores are compared for each racial/ethnic group, white, black and Hispanic students in Texas rank above the average across states, whereas each racial/ethnic group in North Carolina ranks at or below the average across states.[6]

Figures 13-16 compares the average values of four variables commonly used to compare characteristics of state school systems. They are real per pupil spending (adjusted for

cost of living differences), the ratio of pupils to teachers, the percentage of teachers with advanced degrees and the experience level of teachers (less than 10 years, 10 to 19 years and twenty or over). The data compares Texas and North Carolina to the average across states and to the states with the largest and smallest value.[7]

The real per pupil expenditure (adjusted for cost of living differences) in Texas and North Carolina shows both states to be below the average for all states. Texas and North Carolina spend approximately $5300 per pupil compared to an average of $6000 across states. Both states are very near the national average in pupil-teacher ratio and have a smaller percentage of teachers with advanced degrees than the national average.

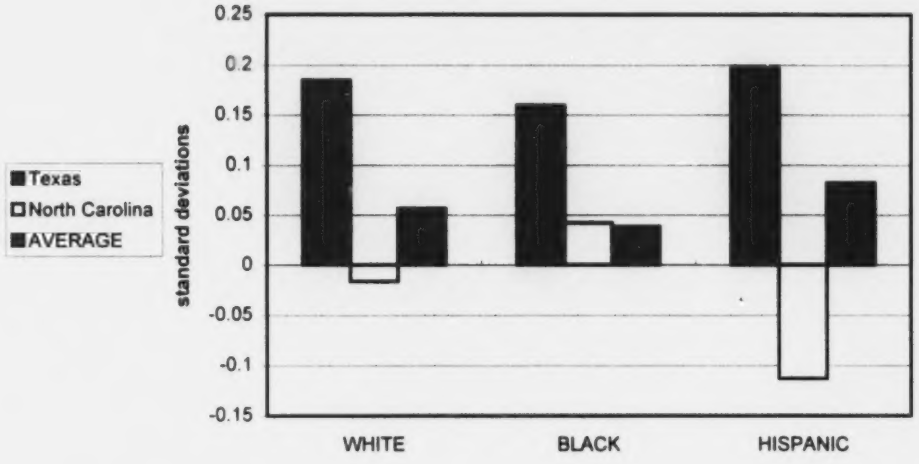
Table 2 - Student Characteristics for North Carolina, Texas and All States

	North Carolina	Texas	State Average
% Black	28.6	12.1	11.3
% Hispanic	2.6	33.4	8.3
Family Income	$32,788	$32,299	$35,002
Parent's Highest Education			
No high school	13.8	19.9	9.9
High school	33.1	27.4	31.1
Some college	30.9	30.1	32.8
College degree	22.3	22.7	26.2

[6] The scores by racial/ethnic group are normalized to the earliest test in each subject and grade and divided by the national standard deviation for the earliest test.

[7] The comparison is made for fourth grade students and would be the characteristics experienced by fourth grade students over their school career from 1991-1994.

Figure 12 - Average NAEP Scores by Racial/Ethnic Groups for North Carolina, Texas and All States



Both states have a less experienced teaching force than the national average with a larger proportion of teachers with less than 10 years of experience, and a smaller proportion with more than 20 years of experience. In all cases both states are nearer the center of the range of variation across states than at either extreme

Figure 13- Per Pupil Expenditures for North Carolina, Texas and All States

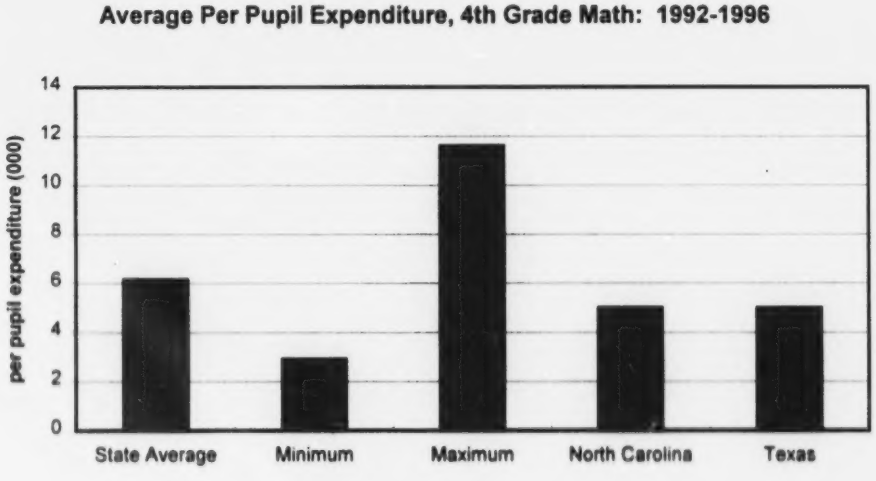


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Figure 14- Pupil-Teacher Ratio for North Carolina, Texas and All States

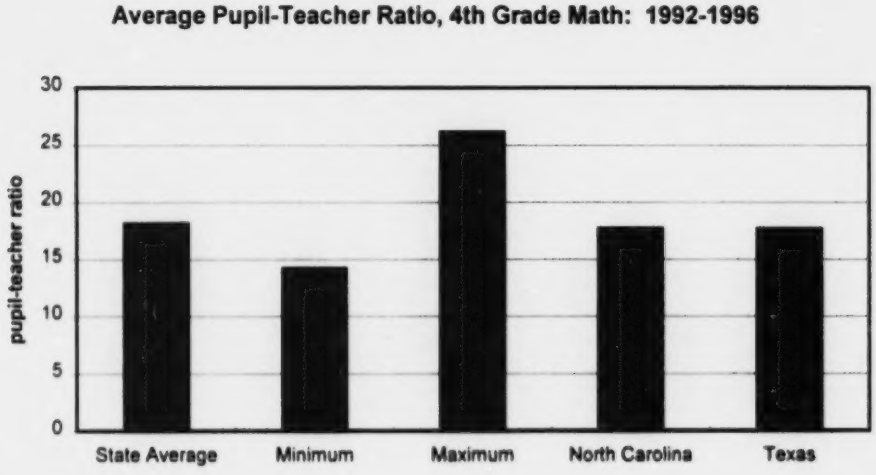


Figure 15-Percentage of Teachers Without an Advanced Degree for North Carolina, Texas and All States

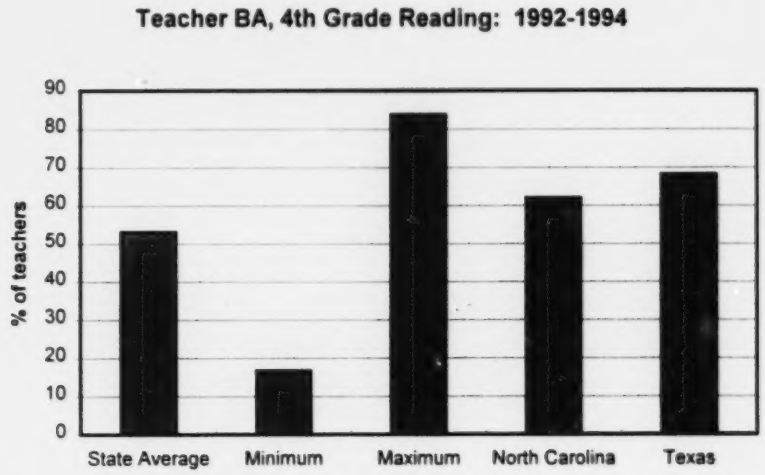
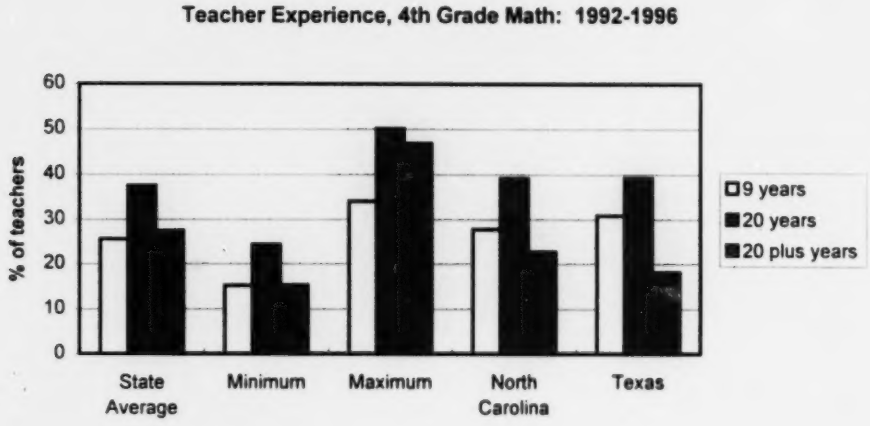


Figure 16- Teacher Experience for North Carolina, Texas and All States



Stability in Student and School Characteristics in Texas and North Carolina

An important question is whether the students, teachers or expenditures per pupil have changed in each state between 1990 and 1996 in ways that may explain the score gains. There have been small increases in both states in the proportion of minority students, but these changes would make it *more difficult* to achieve score increases. The four variables cited above that are commonly hypothesized to be related to higher achievement scores have not changed enough to account for any significant part of the score gains.[8] Table 3 shows the changes that fourth grade students would have experienced over their schooling between 1992 and 1996. The table shows that pupil-teacher ratio would have declined by less than one student per teacher, per pupil expenditure levels increased by less than three percent and the education and experience of teachers changed little. Table 4 shows the similar changes for eighth grade students

[8] The research evidence relating any of the four variables to achievement scores is compelling only in the case of pupil-teacher ratio. Pupil-teacher ratio is strongly correlated with class size. Experimental evidence from Tennessee provides compelling evidence that smaller classes produce higher achievement- with larger gains for minority and disadvantaged students(Krueger, 1998; Mostellar, 1995; Word, et al, 1994, Word, et al, 1990; Finn and Achilles, 1990; Nye, et al, 1995). All the evidence for the other variables comes from non-experimental data that shows few consistent results. This inconsistency may be related to a failure in knowing how to properly specify non-experimental models since many of the common ways used cannot reproduce the experimental results from Tennessee(Krueger, 1998; Grissmer, 1998b).

between 1990 and 1996. These data show fairly small changes in teacher characteristics, but show larger changes over the school career for per pupil expenditures and pupil-teacher ratio especially in North Carolina. However, none of the research literature would suggest that these changes would account for any significant part of the gains registered in either state. For instance, evidence from a research experiment in Tennessee on class size—the best evidence on class size effects—would predict achievement gains from the largest pupil-teacher ratio changes in Texas and North Carolina that are less than ten percent of actual gains (Krueger, 1998). So the large score gains cannot be explained by changes in student or teacher characteristics or spending levels.

Table 3 - Changes in Characteristics of Schools for 4th Graders (1992-1996)

	Change in North Carolina	Change in Texas	Average Change-All States	State Average Value
Pupil-Teacher Ratio	-.07	.06	0.1	16.8
Per Pupil Expenditure	$70	$143	$87	$5640
Teacher Education				
No Advanced Degree	-2.0	5.0	4.9	57.1
Teacher Experience				
0 to 9 years	-2.3	1.5	1.4	25.6
10 to 20 years	-.07	3.3	5.7	37.5
20 plus years	4.7	.7	.6	27.3

Table 4 - Changes in Characteristics of Schools for 8th Graders (1990-1996)

	Change in North Carolina	Change in Texas	Average change-all states	State Average Value
Pupil-Teacher Ratio	-1.7	0.3	0.6	17.1
Per Pupil Expenditure	$726	$456	$587	$5366
Teacher Education				
No Advanced Degree	4.0	4.0	0.7	54.4
Teacher Experience				
0 to 9 years	.04	4.3	1.1	26.4
10 to 20 years	-6.9	2.2	7.4	41.2
20 plus years	3.1	.4	.7	23.5

Searching For a Plausible Explanation

Research Approach

Case studies are a preferred or complementary method to other research methods such as empirical data analysis in several circumstances. Case studies are useful when the "usual" factors hypothesized to cause score gains cannot explain major gains. One must then do more in-depth case studies to discover previously unidentified policies causing score gains. Case studies are also useful when the "policies" are not easily characterized by one or two variables. Common variables like per pupil spending and class size can be captured by a single number. However, capturing more complex policies like the progress on "systemic reform" or the status of state assessment and accountability systems needs more in-depth examination through case studies. Finally case studies are useful when dramatic, unexpected changes occur in a few states.

Case studies of two states can never present compelling evidence that identify the policies causing test score increases. It can, however, be useful in eliminating policies that did not change during the period of score increase and also can identify policies that seemed to change simultaneously with the changes in scores. Ideally, once these more likely candidates are identified, and the data on these policies is collected for all states, statistical analysis can be used to determine whether the results are consistent across all states. If all states that have similar policies show scores increases, it strengthens the evidence relating specific policies to score increases. If score increases are taking place in other states without similar policies, it means that there may be still unidentified policies connected to score gains that might also help explain the Texas and North Carolina gains.

We undertook case studies of the Texas and North Carolina school systems to understand the likely hypotheses to explain the dramatic gains in test scores. We found one similar set of policies common to Texas and North Carolina that were implemented at times that coincided with state test score gains. We did not find major competing hypotheses in either state that might explain the significant score gains.

These policies implemented by both states have to varying degrees been implemented in a number of states throughout the nation. The timing of implementation is different among states, and there are significantly different features of these policies across states. However, these policies across states are certainly a candidate to help explain rising average scores across all states between 1990-1996. While North Carolina and Texas are certainly among the first states to completely and probably more successfully implement the policies described here, finding evidence in other states of the success of these policies would considerably strengthen the evidence for the success of these policies.

Significant Features of Educational Reform in Texas and North Carolina

The policies that can plausibly explain the large gains in elementary level test scores in Texas and North Carolina are easier to characterize than to put in place. So this study will focus both on the policies themselves as well as the processes in each state which resulted in the successful implementation of these policies.

Although the new policies were implemented in both states in the early 1990s and have been sustained to the present, these policies often were third generation improvements in both states. But these policies placed teachers and administrators in a significantly new organizational environment with different incentives. The main elements of the new policies are often summarized as "systemic reform," although the term does not have a singular meaning in the literature (Vinovskis, 1996). The policy of systemic reform was developed and articulated in the education community in the late 1980s (Smith and O'Day, 1990: O'Day and Smith, 1993: Vinovskis, 1996). The business community also seems to have developed a similar approach partly based on restructuring in American business occurring in the late 1970s and 1980s. However, the business emphasis was more on assessment and accountability.

The approach in North Carolina and Texas included:

- ⇒ **establishing clear teaching objectives by grade through state-wide learning standards**
- ⇒ **implementing new, state-wide assessments closely linked to the learning standards**

- ⇒ **establishing a system of accountability with both sanctions and rewards linked to the assessment results**
- ⇒ **establishing a computerized system of feedback on test score performance at the student, classroom, school and district level that can be used for diagnostic purposes**
- ⇒ **emphasizing strongly that all students were expected to meet the standards**
- ⇒ **deregulating the teaching and school environment and giving teachers and administrators more local control and increased flexibility in determining how to meet the standards**
- ⇒ **sustaining the system of assessment and accountability without significant changes over several years**
- ⇒ **explicit shifting of resources to schools with more disadvantaged students**

In such an environment teachers and administrators in Texas and North Carolina appear to be changing their methods of teaching and managing in ways that produce higher test scores. However, we need to learn a lot more about the precise ways that teaching and managing have changed. While there is much anecdotal evidence, there are little solid data that record these changes.

Given specific teaching objectives, teachers are probably increasing the time and attention devoted to achieving the learning standards. Teachers have much better and more timely information in each state about each child's areas of good and poor performance, and there is evidence that such information is commonly utilized. There is some evidence that teachers are allocating their time differently, perhaps making better choices where time can be spent most productively. There is also evidence in some places of increased use of after-school, weekend and summer time for learning. There is some evidence of increases in tutoring activity. Since schools are the primary focus of rewards and sanctions, there is some evidence of increased cooperation within schools. There is also evidence of focused attention and resources on poor performing schools.

At the school principal level, there is evidence of increased attention to the performance of teachers in lifting test scores. Such concerns are evident in decisions of which teachers to hire and which to retain, and how to allocate flexible resources within

schools. There is some evidence of sharing of knowledge and techniques among teachers. Perhaps more attention is given to the content and choice of professional development and parental involvement programs.

At the district superintendent level, more awareness of comparisons of results across schools may be identifying factors that make a difference in test scores at the school level. This awareness probably filters into decisions of which principals to hire and retain. Flexible resources may be allocated differently across schools and professional development programs. In some school districts, all teachers and principals are given training in new management techniques widely utilized in the private sector. There have been visible transfers and retirements of principals in schools with sustained poor performance.

In fact, teachers and administrators appear to be using a wide range of methods to achieve higher achievement scores, partly in response to increased flexibility in decision making at the local level. But it appears to be the changed design of the organizational environment and competitive incentive structure which is responsible for teachers and administrators finding creative ways to foster higher achievement in their students. And there appears to be no single solution for all students or all schools or all school districts.

Clear Teaching Objectives Through State-wide Standards

State-wide learning standards were developed, adopted and maintained in both states in the late 1980s and early 1990s. These learning standards covered each grade and were established in several subjects. Math standards in both states were guided by the National Council of Mathematics Teachers (NCTM) standards developed nationally. But teachers in all grades were given clear objectives for what students should know at each grade level. In both states efforts were made to align the professional development, textbooks and curriculum with the state-wide standards.

State-wide Assessments Closely Linked to Learning Standards

New state-wide assessment tests were also developed in both states which reflected the standards at each grade. Assessment in both states is done in grades 3-8 in

reading and math. State-wide testing to these standards began in Texas in 1993-94 and in North Carolina in 1992-93. The standards and assessments have been remained substantially unchanged in each year since that time.

Computerized Feedback System

Scores on the tests are provided to students, parents, teachers, schools and school districts. Both states have a well-designed computerized system of storing the testing information and providing access to it in various ways to teachers, principals and school districts. Tests are graded centrally in Texas and in regional locations in North Carolina. Access to school level results is provided on the Internet in both states. Both states have developed varied formats for reporting test results by sets of questions related to key learning objectives. Teachers in both states have access to summaries and individual tests of students entering their classes each year. In both states test items are made available after each test to the public to counter criticism of bias in test items.

A System of Accountability

Both states have a multi-level system of accountability. Schools are publicly rated in both states based on their performance on the assessment tests. Both states have financial rewards for schools based on performance. Both states have the power to disenfranchise school districts and remove principals based on sustained levels of poor performance.

A key issue faced by states in establishing systems of accountability is how to take into account the strong correlation of test scores with the socio-economic status (SES) of the students. Perceived unfairness in the system of rankings and rewards can seriously erode the trust necessary for effective incentives. If actual scores were primarily utilized to rank schools and give rewards, the schools in higher SES school districts would currently dominate the top rankings. However, year to year gains in scores can provide a potential advantage to schools with lower SES students since gains can be greater for lower scoring students.

Both states have roughly similar systems for rating schools and providing financial rewards, although there were also significant differences. Both systems take into account two types of measures somewhere in their published scores and school ranking. These two measures are the absolute levels of test scores and the year to year gains in scores. All schools are rated into categories ranging from exemplary to poor performing in both states, although different methods are used for ranking in each state. School scores are also compared to schools having students with similar family background. Perhaps the best measure of whether a system is fair is its longevity and effectiveness in raising scores. In both states the ranking systems appear to have been widely, but not unanimously accepted by educators and the public over the five years of performance.

Both states show awareness of factors that could provide unfair advantage to certain schools. Care is taken to account for incoming students during the year and to adjust beginning gain scores to the actual students in the schools at the start of the school year. Both keep close scrutiny of the students not taking tests. In Texas, 92 percent of students are tested excluding only those with limited English proficiency and certain categories of special education students. However, a smaller percentage of students (about 80 percent) are included for the purpose of ranking schools. This ranking excludes transfer students, all special education and limited English proficiency students. Thus the procedures—although not perfect—are designed to try to take into account the effects on schools of higher student turnover or large numbers of new students with low or high test scores, and to protect against manipulation by teachers or principals.

Holding All Students to the Same Standards

In both states there is a clear emphasis that the learning standards apply to all students outside of those with significant learning disabilities. Disadvantaged students are held to the same standards as advantaged students.

Providing More Local Control and Flexibility to Administrators and Teachers

In the strategic plan developed in each state in the late 1980s and early 1990s there was clear acknowledgment that teachers and administrators could not be held

accountable unless they were given the authority and flexibility locally to determine how to meet the standards. In both states, many statutes governing schools and teaching were repealed. Fewer constraints were placed on district superintendents and principals on how money is spent. The clearly expressed policy was to allow schools locally to take different approaches to achieving the objectives. The state departments of education were downsized in both states, and refocused to the assessment and accountability programs— measurement and reporting scores and organizing resources for poor performing schools and school districts.

In both states there is some evidence of "cottage industries" developing in the private sector, which provide various kinds of services and support for the school systems. These firms may provide supplies, training, curriculum and computerized learning systems. The newer funding flexibility given to local school districts and schools may be partly responsible for the emergence of such firms.

Shifting of Resources to Schools with More Disadvantaged Students

Both states have gradually shifted more resources to schools with more disadvantaged students. In both states this shift has been partially the result of judicial decisions requiring the state to more equitably fund school districts. However, this shift may be an essential element of achieving a system perceived to be fair and equitable to teachers and administrators. All students do not come to school with equivalent levels of family support, and different levels of resources may be required to raise achievement scores for different types of students. Recent research is now supporting the hypothesis that resource levels can make significant differences in achievement, and that disadvantaged students probably benefit more from increased educational resources (Grissmer, et al, 1998c). So the distribution of resources among schools and school districts needs to be perceived as fair and equitable for an assessment and accountability system to function effectively.

The Evolution of Reform in Texas and North Carolina

The current education reforms in place in both states have evolved over at least 20 years. For instance, both states began testing students at least by the early 1980s, and the

current state assessment tests represent third or fourth generation refinements of the testing and assessment process. However, there is one common factor in both states which played the key role in developing the strategic reform initiatives and providing decisive support in the legislature for passage: the business community.

The Key Role of the Business Community

In both states the business community played a critical role in developing the strategic plan for reform, forging compromises whenever possible with the education interests, and passing the necessary legislation. The influence was primarily at the strategic and legislative level rather than the tactical and local level. The strategic plans in both states were generally opposed by the coalition of education interests. These included the various state associations representing school boards, principals and teachers. In both states key organizations were formed and funded by the business community that included a combination of the business, education and policymaking community to provide a mechanism for discussing the issues, forging compromises and, whenever possible, developing consensus and support for legislative passage. Developing these systems in both states was a long and arduous process, and the business community in both states was the single most stable, persistent and long-term influence for the reform agenda implemented.

This influence and persistence was partly motivated by a strong belief that the long term economic development in the state was dependent on higher quality K-12 education—both to attract new industry to the state and to provide workers for the newly developing high tech industries. The persistence and influence were also due to a handful of businessmen in each state who devoted considerable time and energy to learning the education issues, forming relationships with key stakeholders and remained involved over long time periods. These businessmen became trusted by both the larger business community and the education and policymaking communities. In each state leading businessmen were appointed to key policymaking positions in the educational system.

The Role of the Political Community

Political leadership in both states was essential in the period of reform from 1984-1992, but leadership came at times from different offices: the Governor, Lt. Governor or key legislators. Neither state had continuity in party affiliations of the key offices, and both states experienced significant turmoil around education issues at times in this period. Passage of the legislation in neither state was done in straight party-line votes, but rather involved coalitions from both parties. The business community maintained the momentum in the 1984-1992 period in both states with varying degrees of political leadership.

Since the early 1990s, both states have had the advantage of governors with education leading their list of priorities. Governor Hunt has sponsored many new initiatives during his years in office including emphasis on early childhood education through Smart Start to major legislation to improve the quality of instruction and align teacher education in North Carolina with the state's standards. Governor Bush has emphasized programs for mastery of reading skills in early grades and a renewed focus on decentralization. Such leadership seems essential to build and maintain the momentum of earlier reforms and to help maintain the still somewhat fragile coalitions supporting educational reform.

Developing and Implementing the Reform Agenda in Texas

Similar to many states, the agenda for school reform in Texas began in the early 1980's with the appointment of a commission to examine education headed by Ross Perot. The motivation for such a commission appears to have come from several sources. The national report on education, *A Nation at Risk*, was released around this time. However, there was also a growing awareness in the business community that a quality K-12 education system was crucial to the future economy of the state.

This awareness appears to have arisen as the state was trying to attract new industry to the state and to diversify the state economy away from dependence on oil and gas. The economy in Texas had been hit hard by the oil crisis, and diversification was seen as important. Texas had a foothold in the emerging high technology revolution and

attracting and building firms from this sector of the economy was seen as important. In the process of trying to attract industry, the Texas school system came under focus as a key consideration in whether industries wanted to relocate to Texas. Industry representatives were concerned whether their employees would be satisfied with Texas schools and whether the future work force produced by the schools would have the necessary skills.

The Perot Commission began the process of reforming Texas schools. They recommended changing the funding formula for Texas schools which had the effect of shifting resources to more disadvantaged schools. They advocated state-wide testing of students, implementing a tougher high school curriculum and establishing minimum academic requirements for participation in sports. The commission also called for a tax increase to fund their recommendations. The recommendations of the Perot commission were passed in a special session of the legislature with strong support from the business community.

One key provision of the Perot plan was full day kindergarten and a subsidized public pre-kindergarten program for low income families. This program has continued over time with the result that Texas has a greater proportion of its children in public pre-kindergarten than any state in the nation. Research would suggest that this program could be responsible for a small part of score gains in lower grades (Barnett, 1995). A related emphasis in Texas has been to shift resources to K-3 levels from higher levels through class size reductions and other related programs.

After the Perot Commission, leading business leaders remained strongly involved in education in Texas leading to a second round of reform starting in the late 1980s. At that time a research institute dedicated to education was established that was instrumental in drafting a strategic plan for the education system. The strategic plan, contained in *The Path to a Quality Education for all Texas Students* and *A New Accountability System for Texas Public Schools*, mainly reflected a business philosophy of establishing accountability in the school system. It recommended establishing new learning standards for each grade, measuring learning by linking state-wide assessments to those standards, holding schools accountable for results, but not dictating to teachers and principals how

to achieve the results. One key concept was alignment—aligning standards, curriculum and assessments and accountability mechanisms. This philosophy clearly reflected a business orientation to education, but the ideas of the "systemic reform" movement in education developed at a similar time emphasized many of the same features (Smith and O'Day, 1990: O'Day and Smith, 1993).

Certain features of the reform plan appear to have been successfully discovered and implemented in the business community in the late 1970s and early 1980s. American business productivity had lagged in the 1970s and often lacked competitiveness with foreign firms. Perhaps the leading example of this was the automobile industry. Beginning in the late 1970s, a restructuring began to occur in American business that significantly increased the competitiveness of their industries. One of the important elements of that restructuring was a fundamental change in the manager-employee relationship. While employees were given more specific objectives, they were given more opportunity to shape the objectives and freedom to structure the work environment to achieve the objectives. Employee involvement and ideas were increasingly seen as the source of productivity gains.

An organization of business and education leaders called the Texas Business-Education Coalition (TBEC) was also formed in the late 1980s funded by the business community. This organization became the forum for discussing the issues raised in the strategic plan and forging compromises whenever possible. However, an independent lobbying organization called, "Texans for Education" was also formed which only represented the business perspective in education reform.

A key aspect of business involvement in Texas is the presence of a few business leaders who became heavily involved with learning the issues in education and sustained their involvement for over a decade. These leaders became acquainted and understood all sides of educational issues, became acquainted with the decisionmakers at all levels and could articulate the issues to other, less involved business leaders. An illustration of this is the appointment of businessmen to key policymaking positions like the chair of the State Board of Education.

The strategic plan for schools was introduced in the 1991 legislative session with the strong support of the business community and strong opposition from the educational community, although the discussions over the preceding years had narrowed the differences between the two communities. Business leaders were mobilized to support the plan. During the same session, the legislature was also under judicial order to again restructure the school financing and distribution formulas because of perceived inequity among school districts. These two major legislative issues were joined together producing compromises in each, but passage of most elements of the strategic plan.

The elements of the reform plan built on a history of previous standards and statewide testing. State-wide standards and assessments can be traced to the early 1980s in Texas, and the assessments and standards implemented in the early 1990s were at least third or fourth generation. The new standards and assessments were for grades 3 through 8. Minimum proficiency levels were established at each grade for all students. It included both sanctions and rewards based on the results of the assessments at the school level. The sanctions involved the possibility of state takeover of school districts and schools for sustained levels of poor performance. It called for expert teams to examine poor performing schools and recommend ways of improvement. It established a public ranking system for schools based on the school's performance on the assessments. The highest ranked schools received financial rewards for their staff.

Another key element of the strategic plan pushed strongly by business interests was a strong emphasis on improving the data available on schools and students and providing access to the data to superintendents, principals and teachers. Superintendents could obtain detailed data by school, principals could obtain detailed data by classroom and teachers could obtain detailed data by students on achievement. Evidence indicates that this type of data is being heavily utilized at all levels to for diagnostic purposes. Texas reports both absolute and gain scores by grade, school and district disaggregated by race/ethnicity. School performance is also compared to the 40 schools in the state deemed to have the most similar types of students. This allows comparison and interchange of information among more and less successful schools who have similar types of students.

A ranking for all schools into four categories is made on the basis of the percentage of students who meet or exceed an absolute standard. However, an additional key requirement may help explain the larger minority gains. Texas statute requires that assessment results be disaggregated by race, ethnicity, and SES of the students. To meet its performance requirements, each population subgroup in a school or district must meet the target. The top ranked schools need high proficiency for each racial/ethnic group in the school. The combination of the categorical rankings and the comparison of schools of similar types helps solve the problem of ranking schools with students who come from different SES levels.

The standards, assessments and accountability mechanisms in Texas have by and large remained in place since the early 1990s. Stability is important in each of these areas to allow administrators and teachers to become familiar with them, to be able to learn methods and techniques for increasing scores and to have successful techniques spread across classrooms and schools. However, Texas has raised the scores for minimum proficiency level gradually over time as students' scores have increased. One issue on potential bias in assessment questions has been partially solved through annual publication of the tests themselves. Parents, teachers and administrators can challenge items on the test

The apparent success of administrators and teachers at raising children's test scores seems to have significantly muted if not overcome much of the initial opposition to the reforms. Continuing issues remain concerning whether to establish mastery levels in addition to minimum proficiency levels, when and how much to raise minimum standards in view of their success, whether to test in a wider set of subjects and how to design assessments at the high school level. But the basic system of assessment and accountability appear to be accepted by most educators and parents.

Developing and Implementing the Reform Agenda in North Carolina

North Carolina also began reform efforts in the early 1980s partly in response to *A Nation At Risk*, low ranking on the SAT scores and a concern for the future economy of the state. A Commission on Education for Economic Growth in 1984 prepared the first

reform agenda. Its program included pay increases and a pilot career development program for teachers and funding for school facilities and construction as well as for increased funding for a "Basic Education Program".

The next round of reform occurred in the late 1980s and was mainly guided by the North Carolina Public School Forum—a group formed by business leaders and composed of businessmen, educators and policymakers in the state. The timing and makeup of this group parallels very closely the Texas Business-Education Coalition. The Forum produced a strategic plan for education, "Thinking for Living: A Blueprint for Educational Growth," in December 1988.

The major principles of the strategic plan called for alignment of standards, curriculum and assessment tests, called for a strong system of accountability at the school building level with a deregulation of the education environment and shifting more control and flexibility to the local level. Accountability included publishing school report cards based on assessment performance and other measures and linking teacher career development and pay to student performance. The report also called for stronger training for principals and increased attention to early childhood programs. Provisions were passed for "taking over" schools or school systems based on sustained poor performance as well as mechanisms of intervention and support for such districts.

Similar to Texas, the origins of these ideas were attributed to lessons learned by business during the restructuring of the late 1970s and early 1980s. Organizational structures in place prior to restructuring that emphasized procedure rather than accomplishment of objectives implicitly gave employees little flexibility or opportunity to exercise responsibility and stifled initiatives. Business gradually replaced this environment with one which gave employees objectives and increased responsibility, flexibility and participation to determine how objectives were met. In education, this translated into policymakers specifying exactly what they want from schools, providing the basic resources needed to do the job and then giving professional educators the freedom to do what they needed to do to meet those goals. Deregulation was partly accomplished by removing statutes and by making funds more fungible at the local level.

Partly as a response to this plan, North Carolina undertook the development of state-wide learning standards by grade and new assessment testing linked to those standards. The standards and the assessment tests were created based both on the NCTM national standards as well as being aligned with the national NAEP tests. While the new tests were criterion referenced to the North Carolina standards, they were also norm referenced to the national NAEP tests. These tests and standards were implemented in North Carolina in the 1992-93 school year. Funding was also provided for extensive professional development for elementary school teachers based on the new curriculum and textbooks aligned to the standards.

The North Carolina Public School Forum continues to develop new agendas for education reform through joint participation of their business leaders, policymakers and educators. Studies on educational finance resulted in legislation directing more funds to the state's smallest and neediest school systems. Financial rewards for schools were implemented in the 1996-1997 school year. Certified staff in exemplary schools received $750 and aides received $375.

Recent initiatives in North Carolina include reductions in pupil-teacher ratios for lower grades and Smart-Start, a program directed toward early childhood. This program establishes a non-profit organization in each county that receives state funding to aid disadvantaged children. The Board of Directors of these organizations includes representatives from education, health and social service agencies as well as community leaders. Great discretion is provided in determining where the greatest needs lie in each county—from day care to pre-kindergarten programs to health needs to social services to recreation.

North Carolina school reform has been assisted by a booming state economy over this period. Increasing state revenues have made both increased school funding and tax cuts possible, thereby avoiding much of the political conflict that occurs with more limited budgets. North Carolina has also placed more emphasis than Texas on its teaching force. But it is important to realize that gains have been achieved by the current teaching force in both states. While achieving a higher quality teaching force remains an important goal, the evidence to date indicates that the current teaching force is capable of producing

achievement gains if given an appropriate organizational environment and working conditions.

North Carolina began changing the structure of teacher pay as early as its first reform efforts. Pilot efforts were made to develop career paths for teaching and eventually a state-wide pay scale was adopted. The accountability movement provided for links between student performance and teacher evaluations and career progression. Incentive pay has been initiated for schools having high rankings in their state-wide school ranking system. The North Carolina business community through the North Carolina Partnership for Excellence has also emphasized professional development programs for teachers—often modeled after private sector training programs. This partnership has funded training programs in private sector quality management and "Baldrige" criteria in selected school districts that all teachers and administrators have taken.

Concluding Remarks

Perhaps the most important aspect of the reform initiatives in both states is the establishment of a substantial "infrastructure" for supporting a process of continual improvement in education. This infrastructure includes the more visible organizations that have been created and jointly funded through the public and private sectors and includes a mix of public, non-profit and private sector participation and organizations.

This organizational infrastructure includes state focused research institutes and centers, organizations primarily devoted to research based policy formulation, a network of business-school system partnerships, a developing variety of private sector "cottage industries" aiding school improvement with new systems and training methods. This infrastructure allows a continual process of innovation and improvement in the school systems to occur. This infrastructure generates a continuing series of educational improvement plans- each building on previous agendas. It includes continuing analysis and evaluation of the results of previous reform as an important element. In both states research is an integral part of devising reform strategies and evaluation of results. Both states use outside experts to help guide their school improvement.

But perhaps the most important part of this infrastructure is the relationships built upon the shared experience of working together over many years to improve education that has developed among taxpayers, educators, policymakers and business leaders. A fragile, but visible trust in the educational reform agenda has developed in each state partly built on its success to date. It is this still fragile trust which must be maintained over the long run by wise political, educational and business leadership.

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